GRIFFIN

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Title

Commercial Use of Space - The Space Business Era

Abstract

The United States is opening a new chapter in the COMMERCIAL USE OF SPACE. By fostering new commercial enterprises in space, U.S. knowledge and technology shall focus and move from exploration to exploitation, from experimentation to expanded profitable commercial uses. By expanding partnerships with government, industry and academia, the U.S. intends to bring the benefits of space to the people of the world in many commercial forms; new and unique goods and services; self-sustaining space ventures; new avenues for ingenuity and creativity; new ways of doing things on Earth; overall economic growth. Over the next several years, the U.S. will facilitate the expansion of commercial uses of space through the specific actions resulting from the strong national policy put in place by President Reagan. The U.S. Space Transportation System and the new Space Station concept will serve as important cornerstones in carrying out the President's policy in the commercial use of space.

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I. INTRODUCTION

Thank you, Peter for the kind introduction. I'd like to thank the audience for your warm welcome, and for coming to share an exciting new era.

Mr. Ian Pryke, the head of the Washington Office of the European Space Agency said on March 1 of this year:

"... in both Europe and the USA the Spacelab Programme is considered the largest and most successful example of international 'space' cooperation in history."

Our Administrator, Mr. Beggs, said that the Spacelab mission was the most significant NASA accomplishment of the year.

For those of you who may be unfamiliar with Spacelab, Spacelab is a reusable orbital facility, designed and built in Europe with european funds under the direction of ESA. It provides a pressurized, "shirt-sleeve" laboratory, an unpressurized platform and various support services.

Its purpose - To provide ready access to space for a broad spectrum of experimenters in many fields and from many nations.

I think Mr. Pryke's praise of the international cooperative effort is high praise indeed as we view ESA as major contributor to the strength of the European aerospace industry.

As we progress farther into a Space Business Era, it will be international partnerships, such as between ESA and NASA, and between Government, Industry and Academia, that will "size" the Commercial Use of Space.

II. NASA's ROLE IN THE COMMERCIAL USE OF SPACE

How do we develop this new way of doing business?

President Reagan, in his State of the Union Address of Jan. 25, 1984 and in his National Space Policy of July 4, 1982, made the expansion of private investment and involvement in space a major objective of the United States Government. The U.S. Congress has endorsed this thrust.

The President's Program is designed to encourage private enterprise in space commerce to take advantage of these opportunities.

This program requires government and industry to work together; to ease

regulatory constraints and with NASA's help, promote the private sector investment in space.

The intent is to foster an environment where the private sector has the freedom to organize and operate for profit in space.

Bertrand Russell once wrote:

"In our complex world, there cannot be fruitful initiative without government, but unfortunately, there can be government without initiative."

As we move into the Space Business era, I trust we shall be as successful as we were with the satellite communications industry, one of the fastest growing industries today. This new industry has joined the world in a way which would not have been possible 25 years ago.

Last year, in response to the President's National Space Policy, NASA established a task force to develop an agency-wide policy and program plan to enhance the agency's ability to encourage and stimulate free enterprise in space. The task force's report is currently being reviewed by our top management people.

I'd like to share the essence of the task force's report with you.

1. The task force reached three fundamental conclusions

The first is that commercial activities in space by private enterprise should begin now.

Secondly, the task force stated that natural and bureaucratic barriers inhibiting the commercial use of space need to and can be relieved or removed through actions of the government and private enterprises.

And finally, the task force declared that with firm resolve and the commitment of reasonable resources over a number of years, a partnership between government and private enterprise can turn space into an arena of immense benefit.

2. These conclusions lead to the following principles to govern the NASA Commercial Space Policy.

They are:

(1) the government should reach out to and establish new links with the private sector;
(2) the government should not be the overall judge of a project's feasibility or impede private efforts to undertake commercial space ventures;
(3) if the private sector can operate a space venture more efficiently than the government, then such commercial utilization should be encouraged;
(4) the government should invest in high-leverage technologies and space facilities which encourage private investment, and

(5) the government will consider a significant contribution to a private sector initiative under two conditions:
(a) there must be significant private capital at risk, and
(b) there must be significant potential benefits, such as a contribution to economic health or to a positive balance of trade.

NASA intends to establish a high-level office to serve as the focal point for our activities in stimulating space commerce. We intend to consider support for commercial space endeavors which are initiatives from the private sector, particularly new commercial high-technology space ventures and new commercial applications of existing space technologies.

Business in space offers great promise. But it also holds great risk, financially, institutionally and technically. We plan to reduce those risks with a three-pronged approach.

To reduce financial risks, we shall:
- o continue to offer space transportation incentives for high-technology space endeavors,
- o assist in the integration of commercial equipment with the STS, and
- o provide seed-funding to stimulate commercial space ventures.

To reduce institutional risks, we shall:
- o speed integration of commercial payloads into the STS,
- o shorten the evaluation time for NASA/private sector joint endeavor proposals,
- o establish procedures to encourage development of space hardware and services with private capital instead of government funds, and
- o introduce new institutional approaches for strengthening NASA's support of private investment in space.

To reduce technical risks, we shall:
- o support research aimed at commercial applications,
- o ease access to NASA experimental facilities,
- o establish scheduled flight opportunities for commercial payloads;
- o disseminate space technology information of commercial interest,
- o and support the development of facilities necessary to the commercial uses of space.

III. COMMERCIAL AGREEMENTS

Companies who desire new "high-tech" products or services, use various commercial agreements with NASA.

Types of Commercial agreements include:

1) Memorandums of Understanding (MOU)
2) Joint Endeavor Agreement (JEA)
3) Technical Exchange Agreements (TEA)
4) Industrial Guest Investigators

The most substantial of these agreements from the viewpoint of

near-term commercial activities is the Joint Endeavor Agreement (JEA). This is a cooperative agreement in which private participants and NASA share common program objectives, program responsibilities, and financial risk.

On a different level, NASA uses a Technical Exchange Agreement (TEA). Under a TEA, NASA and a company agree to exchange technical information and cooperate in the conduct and analysis of ground-based programs.

An Industrial Guest Investigator (IGI) agreement provides for collaboration between scientists from the private sector and NASA in an experiment of mutual interest.

In these agreements, proprietary and intellectual rights are clearly identified

In all cases, NASA does not fund any of the work performed by the private sector

IV. BUSINESS IN SPACE

Where does the Potential exist for Business in Space?

The question brings to mind something by James Michener in his book, entitled SPACE.

"I am impressed by the fact that President Roosevelt assembled the brightest scientists in America to the White House to help him envisage the things he might have to adjust (to) in the future.

'I want you to tell me what to expect,' he begged, and after three days of intense speculation these men, whose job it was to anticipate the future and who commanded more keys to the future than any other group, failed to predict atomic power, radar, rockets, jet aircraft, computers, xerography and penicillin, all of which were to burst upon the world within the next years. They knew about exploratory research, of course, but they could not believe it would produce functional products so soon. I assure you that if tonight you assembled an equal group of our most learned men, they would not anticipate the simple wonders which will engulf us by the year 2000."

James Michener, SPACE.

An impressive number of companies are already at work or are contemplating business in space. These companies are utilizing the Space Transportation System to develop new business in space.

Some of the firms involved in the Commercial Use of Space include:

- o DuPont (TEA)
  - Research on Catalytic Materials (low G)
- o Honeywell (TEA)
  - Research on Crystal Growth
- o John Deere (TEA)
  - Research on Graphite Formation
- o 3M Company (MOU)
  - Research on thin films and organic crystals
- o McDonnell Douglas / Johnson and Johnson

- Production of Pharmaceuticals in Space

o Orbital Sciences Corporation (MOU)
(Martin Marietta, United Technologies)
- Transfer Orbit Stage (TOS)
- Apogee Maneuvering Stage (AMS)

o Fairchild (JEA)
- Unmanned Space Platform for Lease

o Space Industries, Inc. (MOU, JEA Proposed)
- Man-Tended Space Platform for Lease

Discussions are being held with about 20 other firms.

We may soon see the first products manufactured in space on the commercial market. These products would be for an existing market place.

NASA and the U.S. National Bureau of Standards are working on a plan to produce incredibly tiny and perfect spheres of latex plastic which are exactly equal in size. The spheres are manufactured aboard the Shuttle with a NASA-developed device called the monodisperse latex reactor. They will be extremely useful to calibrate optical devices or biological and chemical laboratory filters. In fact, NBS has recently sold two lots; one for a million and a quarter ($1,250,000) and the second for three hundred thousand dollars ($300,000).

As Michener stated, the great and learned men simply could not believe that functional products could be developed so soon.

And as people in business well know, the true test is in the "marketplace".

Time does not permit me to mention all of the participants. Nor does it allow time to describe their activities.

Many of those involved in the commercial use of space are here at this conference and I hope each of you have a chance to attend the various sessions and meet these people. I am sure that they would be pleased to discuss their approach for the Space Business Era.

Right now, the space business appears to be in the areas in Launch Systems and Services, Communications, Materials Processing, and Remote Sensing.

I'd like to add that materials processing in space evolved out of some things that NASA did on its Skylab program.

Each of these areas will be addressed later by my colleagues.

V. STS AND SPACE STATION

As we expand our management processes to facilitate the commercial use of space, we shall continue to build our transportation systems infrastructure.

Trade companies used sailing vessels (and later streamships) and harbors to base their operations....

Aircraft and airports together provide necessary services to the communities they serve.....

Our STS and Space Station are necessary to support the future commercial use of space.

The Space Transportation System (STS) provides routine access to space. More than just a delivery truck, it includes the ability to recover, repair or return payloads from space. Further, it allows manned interaction with processes on orbit.

The Spacelab mission in November of last year showed that this man-machine interaction is of great benefit, allowing experimenters to vary the operation in progress to pursue newly-developed possibilities. Such interaction occurs between the flight crew and the experiment at hand and between flight crews and ground personnel, maximizing the benefit of the days on orbit.

This same interaction was important in our STS mission when we retrieved, repaired and returned to orbit the Solar Max Satellite.

A Space Station is viewed by industry as a necessary component for successful Commercial Use of Space. At a White House meeting last summer, leaders of U.S. industry (aero-space and non-aerospace) told the President that a U.S. committment to a Space Station is the first step toward a significant industrial investment in space.

In fact, an offical of McDonnell Douglas stated, and I quote:

"the future size of the pharmaceutical manufacturing industry in space depends on having a manned Space Station."

On January 25th of this year, the President of the United States stated in his State of the Union address:

"We can follow our dreams to distant stars, living and working in space for peaceful, economic and scientific gain. Tonite, I am directing NASA to develop a permanently manned space station and to do it within a decade."

"A space station will permit quantum leaps in our research in science, communications and in metals and life saving medicines which can be manufactured only in space. We want our friends to help us meet these challenges and share in the benefits. NASA will invite other countries to participate so we can strengthen peace, build prosperity, and expand freedom for all who share our goals."

"... space holds enormous potential for commerce today. ... We will soon implement a number of initiatives, develop proposals to ease regulatory constraints, and, with NASA's help, promote private sector investment in space."

The President's Space Station proposal is not an end in itself. It is part of his carefully conceived space strategy designed to provide the impetus for an expanded era of space commerce and industrialization that will benefit not only the United States but its friends and allies around the world. The strategy is rooted in the fact that the Space Shuttle, together with a Space Station, will provide the United States and its partners with an unmatched capability to live and work in space routinely and on a full time basis.

Manned and unmanned portions of a space station complex are equally important. Our experience and intuition tells us that people play an important role in space station operations. By automating certain routine functions or processes, space station personnel are free to use their reasoning and intuition to adapt to new events or take advantage of opportunities as they arise.

Hence, a real challenge in the program is to find the unique blend of man and machine to optimize station capabilities.

An important philosophy in the space station design will be modularity. This approach allows maximum potential for evolutionary growth in both size and technology. It allows adaptation to new requirements due to new commercial uses not envisioned at its initiation.

Modularity enables companies or countries to have discrete areas that are essentially their own, and thus, would be able to protect their proprietary interests.

As far as international participants in the program, we will have discussions with Europe, Canada and Japan, and possibly with potential private sector participants.

VI. CONCLUSION

From the very beginning of the U.S. civilian space program, international cooperation and participation has played a major role.

President Reagan, in his State of the Union address, announced a comprehensive plan for space. This plan has three major initiatives:

- o A proposal to build a permanently manned Space Station so Americans can be living and working in space within a decade.
- o An invitation to America's friends and allies to participate in the Space Station Program
- o A program to stimulate cooperation by government and industry in developing the commercial potential of space.

In closing, I can do no better than to quote the words of Vice-President Bush to an audience of U.S. and European space officials:

"Let us continue to be partners, in this and all fields. And let me take this opportunity to assure you that we intend to continue our international cooperative programs, just as President Reagan recently reconfirmed the committment of the U.S. to a vigorous space program."

I would like to thank you for this opportunity and I hope that my remarks have given you a useful perspective.